1. The model is

\[ y_i = x_i'\beta + e_i \]
\[ E(x_ie_i) = 0 \]
\[ \Omega = E(x_ix_i'e_i^2) \]

(a) Find the method of moments estimators \((\hat{\beta}, \hat{\Omega})\) for \((\beta, \Omega)\).
(b) In this model, are \((\hat{\beta}, \hat{\Omega})\) efficient estimators of \((\beta, \Omega)\)?
(c) If so, in what sense are they efficient?

2. Take the model

\[ y_i = x_i'\beta + e_i \]
\[ E(x_ie_i) = 0 \]
\[ e_i^2 = z_i'\gamma + \eta_i \]
\[ E(z_i\eta_i) = 0. \]

Find the method of moments estimators \((\hat{\beta}, \hat{\gamma})\) for \((\beta, \gamma)\).

3. The model is

\[ y_i = x_i'\beta + e_i \]
\[ E(e_i | x_i) = 0 \]

where \(x_i \in R\). Consider the two estimators

\[ \hat{\beta} = \frac{\sum_{i=1}^{n} x_i y_i}{\sum_{i=1}^{n} x_i^2} \]
\[ \tilde{\beta} = \frac{1}{n} \sum_{i=1}^{n} \frac{y_i}{x_i} \]

(a) Under the stated assumptions, are both estimators consistent for \(\beta\)?
(b) Are there conditions under which either estimator is efficient?
4. The datafile hprice1.dat contains data on house prices (sales). There are 88 observations and 10 variables. The variables are (in order)

1. price, in dollars
2. assessed value, in dollars
3. number of bedrooms
4. size of lot, square feet
5. size of house, square feet
6. dummy = 1 if home is colonial style
7. log(price)
8. log(assessed value)
9. log(lotsize)
10. log(sqrft)

Estimate a linear regression of price [1] on the number of bedrooms [3], lot size [4], size of house [5], and the colonial dummy [6]. Calculate 95% confidence intervals for the regression coefficients using both the asymptotic normal approximation and the percentile-t bootstrap.